

Microfinance and the Interaction of Macroeconomic Factors in Poverty Reduction

Esmeralda Doçi

Phd. Candidate, Department of Finance and Accounting, Agricultural University of Tirana, Albania
Email: esmeralda.doci@yahoo.com

Doi:10.5901/ajis.2016.v5n2p209

Abstract

Microfinance is known as a valuable tool for increasing the welfare and reducing the poverty. Due to lack of data, most studies on poverty alleviation are limited. However, recently there have been empirical studies that show the interaction of macroeconomic factors and of microfinance in poverty reduction. Micro-credit is modelled as a pure element of the microcredit market, which may increase the GPD in the long run. Following the studies of the previous work, the paper aims to test the hypothesis: the impact of macroeconomic factors and of microfinance on poverty reduction. The hypothesis' testing and evaluation is conducted through econometric estimation and through Eviews program.

Keywords: microfinance, macroeconomic factors, poverty, econometric estimation, regression analysis

1. Introduction

Microfinance, according to Otero (1999, p.8) is "the provision of financial services to low-income poor and very poor self-employed people". Micro-credit or microfinance is seen as one of the most important innovations in the policy of development in the last twenty-five years.

First of all, this movement aims to expand the small amounts of borrowers' capital for the poor all over the world, in most cases destined to increase the income of their businesses, by self-employment. More enhanced techniques and ways of credit were achieved during the process. For instance, pioneering banks of rural credit are; The Grameen Bank in Bangladesh, The Bank for Agriculture and Agricultural Cooperatives (BAAC) in Thailand etc. They have shown effectiveness of the microcredit technique. Secondly, microfinance has received attention for its seasonal use and regional cash -flow information. Thirdly, empirically there is evidence that theatrically significant mechanisms are practiced. Fourthly, there is some evidence of positive links between the consumption and other variables. The study of micro-credit effect in the economic growth, in inequality, output per capita and poverty is used by Banerjee and Newman (1993).

The paper is built on the basis of several stages: Firstly, we have presented the literature's review where studies and results of international authors regarding the study of the links between microfinance and macro-economic factors are highlighted. Secondly, the micro-financial environment and the micro-financial institutions in Albania are studied. Thirdly, the followed methodology has been identified in the realization of the paper. Fourthly, we have presented the analysis of the research problem. Finally, results obtained from the econometric analysis and recommendations have been identified.

2. Analysis of the impact of microfinance on poverty reduction in macro perspectives

Microcredit may reduce the long-term poverty inequality Christian Ahlin, Neville Jiang (2008).

The majority of recent studies of the microfinance impact on poverty or in income are based on micro-level evidence based on household data but in absence of reliable data of the microfinance impact in macro level on poverty are limited. However, some studies have shown the relationship between microfinance and economy Imai, K. S., Gaiha, R., Thapa, G., & Annim, S. K (2010). The aim of these studies is the examination of the relationship between the macroeconomics and microfinance activities or the microfinance performance such as Ahlin et al. (2010), Ahlin dhe Lin (2006) and Kai dhe Hamori (2009). The aim of these studies is the study of the environment where microfinance operates, the effectiveness of microfinance in the main macroeconomic variables as gross domestic product, inequality, poverty etc. Previous studies have shown that microfinance has an impact on poverty reduction Imai, K. S., Arun, T., & Annim, S. K. (2010).

However, such studies include a number of challenges such as:

- a) Identification of microfinance activities in terms of availability or intensity
- b) Identification of the performances' effect, distinguishing the presence and degree of microfinance in the macro indicators.
- c) Estimation of coefficients related to microfinance.

The aim of this paper is the study of the impact that microfinance and main macroeconomic variables have on poverty reduction.

Specifically, a country with MFIs that has high credit portfolio gross, has a low level of poverty, because factors that affect poverty have been studied taking into account the endogeneity associated with gross portfolio of MFIs. In the perspective of a bank policy it is important for development finance institution and microfinance investment to reevaluate their loan portfolios of micro finance, that are funds for loans and other microfinance portfolios.

2.1 The last studies of microfinance and poverty

The background study is the summary of the theories and studies that previous author have given regarding the relation between microfinance and poverty, such as the evidence in micro level of the impact of microfinance on poverty alleviation in India and Bangladesh.

Imai et al. (2010) has analyzed the effect of the IMF approach and the IMF loans in the poverty household economy in India. The study was conducted on the basis of national-level data, and household economy provided by rural systems in India. The approach showed that the presence of IMFs and the loans offered by them have significant effect in poverty reduce. The used data was indexed by IBR indicator, indicator that reflects the dimensional aspects of poverty, food security, assets, health, employment and agricultural activities. The findings showed that families in poor areas, the approach to poverty reduction is greater when these families borrow from MFIs, than in the case of simply having only access to MFIs. In urban areas, access simply by MFIs has the largest average effect on poverty than taking loans from MFIs for productive purposes. The customer's purpose for loans is important in determining the outcomes for poverty reduction.

Imai K. S. Azam, M. S (2012) recently analyzed the effects of microfinance on poverty reduction in Bangladesh on the basis of panel data. The data is based on surveys of four phases, which are conducted by the Institute for Development Studies for the Foundation Support of Rural Employment, financed by the World Bank. The four stages of the study were conducted during December-February period in 1997-98, 1998-99, 1999-2000 and 2004-05. At each stage the study covered over 3,000 families distributed evenly across Bangladesh.

Imai , K. S. , Azam , M. S , (2012) have applied the effects of the treatment model and the disposition of the consistency of results:

- a) " treatment " is if the family has access to MFI loans for general purposes or for productive purposes ,
- b) The dependent variable is per capita household income.

Imai and Azam have found that easy access of a family to MFIs doesn't have a significant increase in the household income per capita, while loans for productive purposes have impact on income, which complies with the finding of Imai et al (2010), the findings on rural families in India. In short, microfinance, and in particular loans for productive purposes, reduce poverty, significantly, it is proven in India and Bangladesh.

2.2 Microfinance and microfinance institutions in Albania

Albania is one of the poorest countries in Europe. The effects of the transition from a centralized economy to a market economy in a democratic country, have contributed significantly on the Albanian people, particularly on the poor people. Despite strong economic growth in recent years, almost a quarter of the population lives below the poverty level with a sum of 2 USD a day. The poorest of the poor account for about 5 percent of the population who struggle to provide the daily food. The level of poverty from 2002-2008 is presented below.

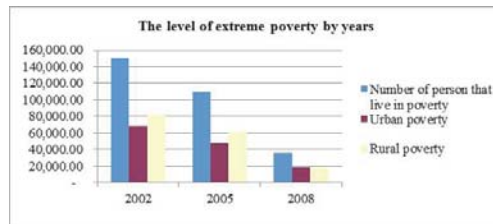


Table 1. The level of extreme poverty by years

Source: INSTAT, author's calculation

Microfinance has developed in Albania; this is noted by the presence of microfinance institutions that have contributed to poverty reduction and economic development in general and agricultural development in particular. Some of the institutions that can be mentioned are: Albanian Savings and Credit Union, "Besa" Foundation, the FFZM, First Financial Company, etc. Precisely the loan is the necessary instrument of the agriculture funding, to promote, develop and increase it, and more effective compared to grants. Lending to the agricultural sector in the portfolio of bank loans represents the least credit sector compared to other sectors, benefiting around 2% of the total loan portfolio, extended to the Albanian economy. Given the need of the agricultural sector for financing or credit, today there are financial institutions that provide financial services to the agricultural sector, such as microfinance institutions that offer credit, but nowadays many banks of the second level are promoting and competing with each other in terms of new service of microfinance / credit of the agricultural sector.

Nowadays, we notice a growing tendency of the presence of banking and microfinance institutions that offer different financial services for the benefit of farmers and poor people. This initiative has a positive impact in the development of the country, for this way we will have an increase of domestic production, incentive for small enterprises' openings or expansion of farms. Micro-credit is seen as a "miracle" that provides the necessary liquidity for families to create or develop their businesses. Loans and Deposits that financial institutions offer, and the analysis of the period of the total amount from 1993-2013 is presented below.

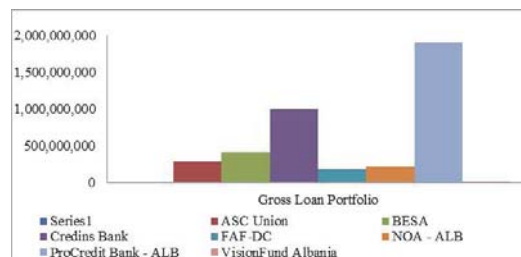


Table 2. The portfolio of loans provided by financial Institutions, from 1999-2013

Source: Cross- Market Analysis, MIX Market, author's calculation

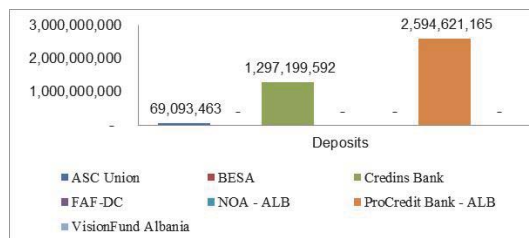


Table 3. Deposit portfolio offered by Financial Institutions, from 1999-2013

Source: Cross- Market Analysis, MIX Market, author's calculation

Compared to the countries of the region that our country is compared to, we see that the presence of microfinance institutions, the micro financial activities and the number of the barrowers is low. The level of these indicators remains low.

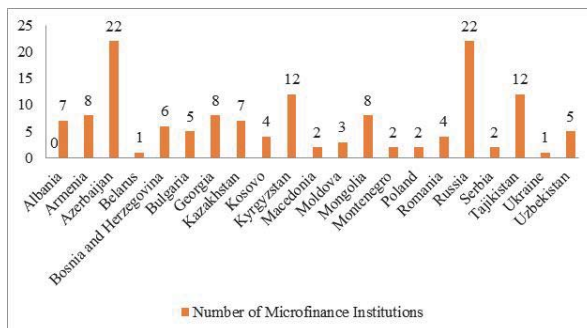


Table 4. Number of Microfinance Institutions by Eastern Europe and Central Asia

Source: Cross- Market Analysis, MIX Market, author's calculation

The number of MFI in our country reaches 7 institutions, compared to the Balkan countries, we have a positive indicator, and however the highest number of MFIs is in Azerbaijan and Russia.

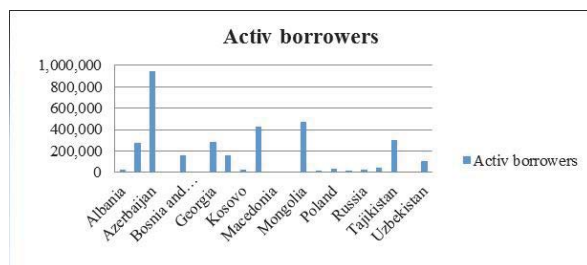


Table 5. The number of borrowers by Eastern Europe and Central Asia

Source: Cross- Market Analysis, MIX Market, author's calculation

The number of active barrowers in the Microfinance institutions is high, as mentioned before in Azerbaijan, in our country it doesn't exceed 50,000 barrowers. Compared to Kosovo and Bosnia and Herzegovina we have a higher number of barrowers.

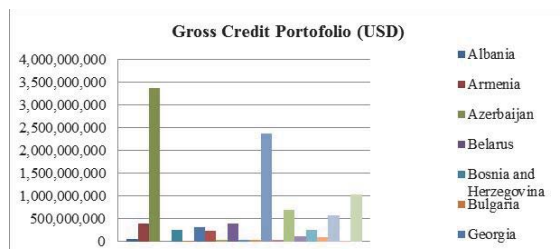


Table 6. Gross Credit Portfolio by Eastern Europe and Central Asia

Source: Cross- Market Analysis, MIX Market, author's calculation

3. Methodology

Measuring the rate sensitivity of poverty alleviation towards the financial and economic indicators' changes is quite difficult. However, continuous efforts have been made to the building empirical models, which measure the extent of the impact of different macroeconomic variables on such indicators.

The purpose of our paper is the study of the impact of macroeconomic indicators, and microfinance poverty reduction. Problem analysis is focused on the study of the link between macroeconomic factors of our country and the importance that these factors have on poverty alleviation. The study was conducted at econometric level. In the paper we are focused on analyzing the impact of the econometric macroeconomic factors, and microfinance in poverty alleviation in Bangladesh from 1980 - 2014. In the econometric analysis we have taken into account the economic problem by following the stages of the econometric analysis from the spread of the problem, the evaluation and statistical hypothesis testing.

Basic assumption of the problem: The macroeconomic and microfinance factors have an important impact on the poverty alleviation.

3.1 Source of data

Time series for this paper are taken from the World Bank database and MIX¹. The bases of the used data are annual. The access of the time series data on poverty for the developed countries is very difficult. The measure's methods of poverty have been the subject of difficult empiric studies. Different indicators have been used for poverty measurement. The latest studies (Leibbrandt, M., & Woolard, I. 1999) and (Datt, G., & Ravallion, M 1992) proposed the capital consumption of employees as a reliable and sustainable source. However, Odhiambo (2009) used the final consumption expenditure collected from OECD online database. This term is used in accordance with the World Bank definition of poverty "the inability to reach a minimal living standard, measured in terms of basis consumer needs (Odhiambo 2009).

As mentioned above, the measure of poverty is difficult; as a result we can't provide time series for analysis. In this paper, the final consumption for family is used as a proxy data for the poverty measurement. There are used two indicators, the number of microfinance institutions and the loan portfolio of MIFs for the measurement of microfinance activities of a country. The number of MIFs or active borrowers is used as a weighting factor or as one of the expository variables. Other variables included in the model are Gross Domestic Product, GDP deflator.

Empirical analysis of the problem is based in the usage of econometric statistical methods, namely Eviews program.

3.2 Model rate

The reviewed model in our study is the link between poverty and macroeconomic indicators. The model is presented as below:

$$Poverty = \beta_0 + \beta_1 * GDP(DEF) + \beta_2 * GDP + \beta_3 * GLP + \beta_4 * NoA + u$$

- Pov- Household final consumption expenditure
- GDP DEF- GDP deflator
- GDP- Gross domestic product
- GLP²- Gross loan portfolio of MFIs
- NoAB –the number of active borrowers of microfinance loans.)

4. Problem analysis

Since we are dealing with dynamic time series to estimate reliability and evaluation of assumed model, it is important to determine if we are dealing with stationary series or not. A time series to be stationary or stable should fulfil some condition such as:

$$E(Y_t) = C$$

¹ Microfinance Information Exchange(MIX Market)

² Gross Loan Portfolio

Variance (Y_t) = σ^2

Auto covariance (Y_t) = Auto covariance (Y_{t+m})

1. Random process average is constant
2. Dispersion is constant during all the time
3. Auto conversations for different delays are same, despite in which time they are calculated.

If at least one of the conditions is not met, the series will be called non-stationary series. Such series have a clear trend and its variation in time presents a systematic behaviour. Using regression methods used in the time series provided that the series is stationary, or else the results of the evaluation model assumed by Fischer or "student" tests might be discussed and we will have unreliable results. To discover if the series are stationary or not there are several methods:

1. Graphic method
2. Autocorrelation method
 - ✓ Box Piers Method, Ljung
3. Method of unitary root:
 - ✓ Simply Dickey-Fuller method
 - Expanded Dickey-Fuller method
 - Filip Peron test

As you can see there are some econometric methods, but in our study are used methods of expanding Dickey Fuller method and Philip Peron, which is as Dickey Fuller simple method, but as the dependent variable is D (POVERTY) and independent variable is POVERTY with dynamic delay, but has a constant in problem treatment.

Through Eviews we have estimated the model and calculate relevant indicators as follow:

$$\Delta(\text{POVERTY}_t) = 71.153 - 0.629 \text{POVERTY}_{t-1} + e_t$$

Where:

POVERTY_{t-1} – POVERTY with first order of dynamic delay

$\Delta(\text{POVERTY})$ – Chain difference of POVERTY

PP Test Statistic	-2.9532	1% Critical Value*	-3.886751
		5% Critical Value	-3.052169
		10% Critical Value	-2.666593

ADF statistic > 5% ---- (-2.9532) > (-3.0521), absolute factice value is bigger than critic value and in this case we proved that series is stationary, base hypothesis that series is not stationary it is not true.

Since the above test series we proved the stationary, we are already able to perform regression analysis and assuming auto regression model.

4.1 Regression analysis of the model

Application of regression analysis and econometrics forecast of economic occurrences is accomplished through a process called stages of econometric analysis:

1. Formulation of the model, theory, economic hypothesis
2. Specification of suitable economic model
3. Data Collection
4. Model evaluation
5. Hypothesis testing
6. Results interpretations

Below are all analyzed all stages by Eviews analysis, using CMSS (Common Method of small squares). The form of assumed model is:

$$\text{Poverty} = \beta_0 + \beta_1 * \text{GDP(DEF)} + \beta_2 * \text{GDP} + \beta_3 * \text{GLP} + \beta_4 * \text{NoA} + u$$

Precisely through the formulated model we want to prove the hypothesis:

Ho: The effect of macroeconomic factors and microfinance it is not important in poverty reduction

H1: The effect of macroeconomic factors and microfinance it is important in poverty reduction

Through Eviews, are realized several types of models, and we have achieved the best model as is shown below:

$$\text{POVERTY} = -1941.87470199 + 26.8534527731 * \text{DGP_DEF} - 0.0187594920512 * \text{GDP} - 0.00180344085968 * \text{GLP} +$$

0.00533938312952*NOAB + u

4.2 Interpretation of parameters

↳ **-1941.8** shows that even when all independent variables are one, the poverty will decrease by -1941.8.

↳ **26.85** shows that if GPD_DEF increases by 1% in the stage-t, while the other variables are kept constant (unchanged), then the probability to eradicate poverty for the t-stage will increase by 26.8%.

↳ **(-0.018)** shows that if the GDP increases by 1% in the stage-t, while the other variables don't change, the probability to alleviate poverty is expected to decrease by 0.0189%.

↳ **(-0.0018)** shows that if the gross loan portfolio for the stage-t increases by 1% while the other variables don't change, the probability to alleviate poverty is expected to decrease by 0.0018%.

↳ **0.0053** shows that if the number of active borrowers of microfinance for the stage-t increases by 1% while the other variables don't change, the probability to alleviate poverty is expected to increase by 0.0053%.

The regression coefficient sign complies with the economic logic which means that the link between the variable is constant.

R² the coefficient of determination is 0.9881 shows that 98.81% of the general variation (% of the probability to alleviate poverty) is defined by the caused variation by the 3 factors that we have specified in the model.

R- Correlation coefficient is $R = \sqrt{0.9881} = 0.9940$, an indicator that is close to 1, which shows a strong positive linear connection between the possibilities to alleviate poverty with the independent variables.

Some comparison criteria are used in achieving the above model:

1. The coefficient of determination R²
2. the adjusted coefficient of determination R²gj
3. Akaike Criteria
4. Shwarc Criteria

All the above mentioned criteria rated in in significance level 5% resulted better, which means that R² and R²gj have higher values and the Akaike criteria and Shwarc criteria have smaller values. Also for the evaluation of the model are also taken into consideration the coefficient of regression and the whole model.

The whole model results important Prob Fstatist = 0.0000 < 0.05

The whole coefficients result important, their prob < 0.05.

For a model to be valid it has to fulfil one of the conditions, that rises from the use of CMSS which is used for its evaluation:

- a. The error term must be normal distributor, which means that it shouldn't have a tendency or a certain trend.
- b. To see if the error term has a constant dispersion means that the error term doesn't have a defined link or a trend between the remaining factors and the dependent variables, that is the % of the failure to return the loan. Therefore we express the free term depending on other variables and evaluate this model again.
- c. The error term must not have autocorrelation. The autocorrelation shows us that if the error terms are linked and dependent between them, which gives us an error in the coefficients' evaluation, means that they are not true. There are used some tests in the autocorrelation testing, but in this paper the LM test is used.

To define if the error term is normally spread or not, the Jarque Bera test is used, in which results that **JB= 0.95** $\chi^2_{0.05, 5} = 11.07$, from the result of the test the actual value of **JB** is **0.95** and the probability to get this value is **0.61**. So, the actual value is smaller than critical chi-square (**0.95 < 11.07**), which means that the basis hypothesis stands, the error term is normally spread, that's why the chosen linear model is accepted.

In the Heteroscedasticity test the White test is used, from where we have attained these results:

From the Heteroscedasticity test we notice that the probability is 0.538 and it is greater than (0.05), that's why Ho is accepted. This means that there is no Heteroscedasticity.

It is also proven that the error term doesn't have the serial correlation, therefore the Breusch-Godfrey Serial Correlation LM Test is used, from which results that **N*R² = 4.10**, $\chi^2_{0.05, 8} = 15.51$ **Vf < Vkr**, Ho stands, the error term through the LM test shows that there is no autocorrelation.

5. Conclusion

Microfinance is seen as one of the most important innovation in the development policy in the first twenty-five years. Nowadays the presence of the instruments offered by MFI, microfinance and microcredit have experienced an ever

growing development. Today many second level banks have added microcredit in the financial service range offered to clients.

Microfinance is seen as an important instrument in the poverty reduction. Based on previous studies from different authors we have analyzed the impact that microfinance and macroeconomic factors have in reducing poverty in our country. Through statistical analyses we have evaluated the reliability and validity of the model, where the data obtained have shown that the supposed model is an important model and macroeconomic and microfinance factors have an impact on poverty reduction.

The data of the study will be useful for the development partners, because they will offer an overview of the effects of the MFIs microcredit in poverty, encouraging further studies about the impact of microfinance in developing country. These objectives are important in function of increasingly important role that MFIs have in the alleviation of poverty in developing countries.

References

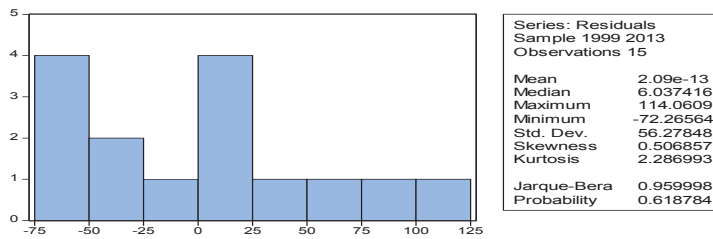
- Banerjee, Abhijit V, Andrew F. Newman. (1993). Occupational choice and the process of development. *Journal of political economy*, 274-298.
- Christian Ahlin, Neville Jiang. (2008). Can Micro-Credit Bring Development? *Journal of Development Economics*.
- Datt, G., & Ravallion, M. (1992). Growth and redistribution components of changes in poverty measures: A decomposition with applications to Brazil and India in the 1980s. *Journal of development economics*, 38(2), 275-295.
- Imai, K. S., Azam, M. S. (2012). Does microfinance reduce poverty in Bangladesh? New evidence from household panel data. *Journal of Development Studies*, 633-653.
- Imai, K. S., Arun, T., & Annim, S. K. (2010). Microfinance and household poverty reduction: New evidence from India. *World Development*, (pp. 1760-1774).
- Imai, K. S., Gaiha, R., Thapa, G., & Annim, S. K. (2010). *Analysis of poverty reducing effects of microfinance from a macro perspective: evidence from cross-country data*.
- Leibbrandt, M., & Woolard, I. (1999). Household incomes, poverty and inequality in a multivariate framework. *Development Policy Research Unit*.
- Odhiambo, N. M. (2009). Financial deepening and poverty reduction in Zambia: an empirical investigation. *International Journal of Social Economics*, 37(1), 41-53.
- Osmani, M. (2010). *Econometrics with its application*. Tirane.

Annex:

EvIEWS analysis, using CMSS (Common Method of small squares):

Dependent Variable: POVERTY				
Method: Least Squares				
Sample (adjusted): 1999 2013				
Included observations: 15 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1941.875	474.9128	-4.088908	0.0022
DGP_DEF	26.85345	4.775963	5.622625	0.0002
GDP	-0.018759	0.037183	-0.504521	0.0348
GLP	-0.001803	0.001730	-1.042597	0.0117
NOAB	0.005339	0.002551	2.092875	0.0328
R-squared	0.988144	Mean dependent var		2263.667
Adjusted R-squared	0.983402	S.D. dependent var		593.9064
S.E. of regression	76.51445	Akaike info criterion		11.77404
Sum squared resid	58544.61	Schwarz criterion		12.01005
Log likelihood	-83.30528	Hannan-Quinn criter.		11.77152
F-statistic	208.3711	Durbin-Eaton stat		0.843766
Prob(F-statistic)	0.000000			

Jarque Bera test:



Phillips -Perron Test:

Null Hypothesis: D(POVERTY) has a unit root				Phillips-Perron Test Equation			
Exogenous: Constant				Dependent Variable: D(POVERTY,2)			
Bandwidth: 3 (Neeey-Eest using Bartlett kernel)				Method: Least Squares			
		Adj. t-Stat	Prob.*	Sample (adjusted): 1998-2014			
Phillips-Perron test statistic				Included observations: 17 after adjustments			
Test critical values:	1% level	-3.88675		Variable	Coefficient	Std. Error	t-Statistic
	5% level	-3.05217		D(POVERTY(-1))	-0.629574	0.107362	-5.864016
	10% level	-2.66659		C	71.15355	18.79555	3.785659
*MacKinnon (1996) one-sided p-values.				R-squared	0.696274	Mean dependent var	33.82353
Earning: Probabilities and critical values calculated for 20 observations				Adjusted R-squared	0.676026	S.D. dependent var	128.1051
and may not be accurate for a sample size of 17				S.E. of regression	72.91574	Akaike info criterion	11.52662
Residual variance (no correction)		4691.211		Sumsquared resid	79750.58	Schwarz criterion	11.62464
HAC corrected variance (Bartlett kernel)		4496.536		Log likelihood	-95.97625	Hannan-Quinn criter.	11.53636
				F-statistic	34.38669	Durbin-Eaton stat	1.66888
				Prob(F-statistic)	0.000031		

